

**Space Weather Highlights**  
**22 – 28 January 2007**

**SEC PRF 1639**  
**30 January 2007**

Solar activity was at very low to low levels. New Region 940 (S06, L=040, class/area, Dao/180 on 28 January) rotated onto the visible disk on 26 January. This Region is likely the return of old Region 933 (S03, L=032, class/area, Cao/210 on 31 December). Preceding its appearance, a long duration B9 flare occurred at 24/1452 UTC with an associated CME (approximate plane of sky speed of 580 km/s). Also, a long duration C6 occurred at 25/0714 UTC at approximately S08 on the east limb with an associated asymmetric halo CME (approximate plane of sky speed of 1260 km/s). Only one more C-flare was observed from this region, a C3 at 25/2143 UTC.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached high levels during the summary period.

The geomagnetic field was mostly quiet at all latitudes. The period began with the solar wind speed at ACE around 470 km/s. Wind speed gradually declined to a low around 280 km/s by midday on 27 January before increasing to around 350 km/s by the end of the period. The IMF Bz did not vary much beyond +/- 5 nT throughout the summary period. A solar sector boundary crossing was observed midday on 26 January.

**Space Weather Outlook**  
**31 January – 26 February 2007**

Solar activity is expected to be at very low to low levels with a chance for an M-flare from Region 940 until it rotates off the visible disk on 08 February.

No proton events are expected at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to be at high levels during 31 January – 06 February, 10 – 11 February, 13 – 24 February, and again on 26 February.

The geomagnetic field is expected to be at quiet to minor storm conditions. Unsettled to minor storm levels are expected during 31 January due to a recurrent coronal hole high speed stream. Quiet to unsettled conditions are expected during 01 – 10 February. Unsettled to minor storm levels are expected during 11 – 14 February due to another recurrent coronal hole high speed stream. Quiet to unsettled conditions are expected on 15 – 24 February. On 25 – 26 February, a recurrent coronal hole high speed stream is expected to produce active to minor storm periods with the possibility of isolated major storm conditions.



### *Daily Solar Data*

Date	Radio Flux 10.7 cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background	Flares							
					X-ray Flux			Optical				
					C	M	X	S	1	2	3	4
22 January	79	23	120	A1.8	0	0	0	0	0	0	0	0
23 January	79	18	170	A1.8	0	0	0	0	0	0	0	0
24 January	80	15	160	A3.1	0	0	0	2	0	0	0	0
25 January	80	11	60	A6.5	2	0	0	0	0	0	0	0
26 January	80	11	120	A4.6	0	0	0	0	0	0	0	0
27 January	81	11	170	A1.5	0	0	0	0	0	0	0	0
28 January	82	13	180	A2.2	0	0	0	0	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day-sr)			Electron Fluence (electrons/cm <sup>2</sup> -day-sr)		
	>1 MeV	>10 MeV	>100 MeV	>.6 MeV	>2MeV	>4 MeV
22 January	2.6E+6	1.7E+4	3.9E+3		5.5E+8	
23 January	2.3E+6	1.7E+4	4.3E+3		5.2E+8	
24 January	3.2E+6	1.7E+4	4.2E+3		6.1E+8	
25 January	3.9E+6	1.7E+4	4.4E+3		5.9E+8	
26 January	3.7E+6	1.7E+4	4.2E+3		4.1E+8	
27 January	3.5E+6	1.7E+4	4.2E+3		1.4E+8	
28 January	5.0E+6	1.9E+4	4.4E+3		7.6E+7	

### *Daily Geomagnetic Data*

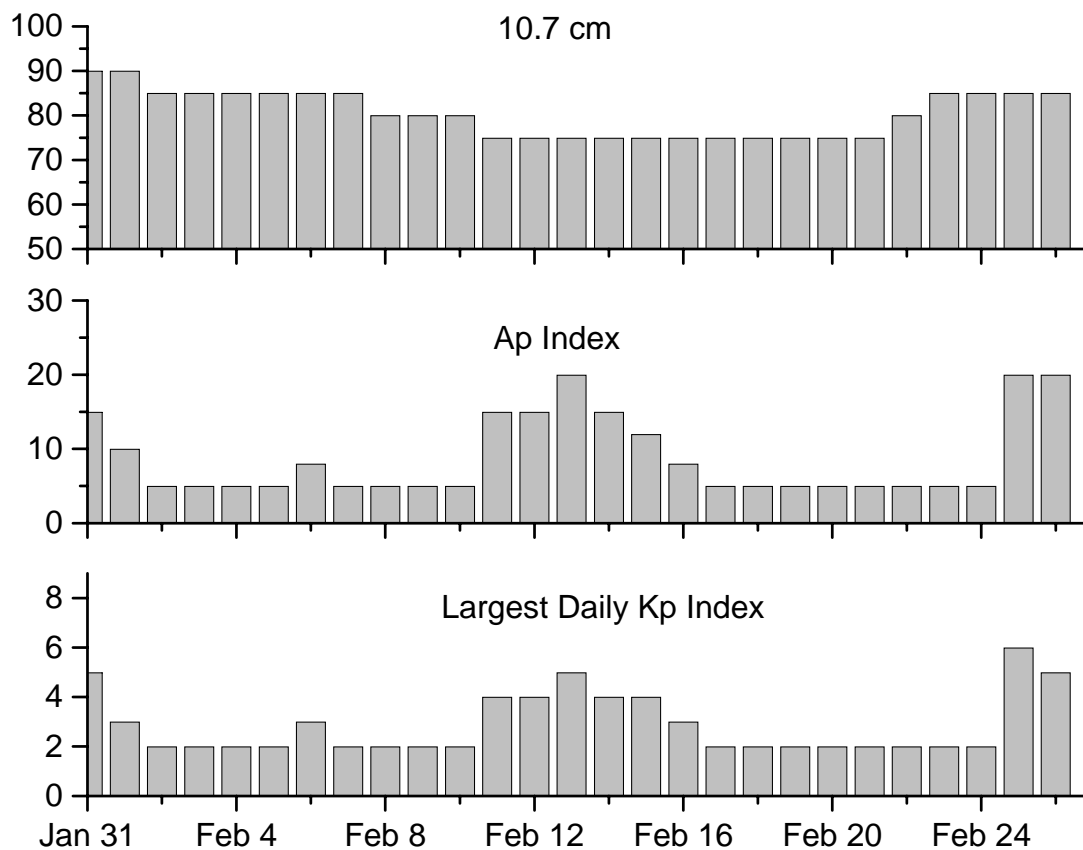
Date	Middle Latitude		High Latitude		Estimated	
	Fredericksburg		College		Planetary	
	A	K-indices	A	K-indices	A	K-indices
22 January	2	0-0-2-1-1-1-1-0	3	0-0-1-2-2-0-1-1	3	1-0-1-1-1-0-1-1
23 January	3	1-1-0-1-1-3-0-0	1	1-1-0-1-0-0-0-0	2	1-1-0-0-0-0-0-1
24 January	1	0-0-0-0-1-1-0-0	1	0-0-0-1-0-1-0-0	1	0-0-0-0-1-1-0-1
25 January	1	0-0-0-0-0-2-1-0	1	0-0-0-2-0-0-0-0	1	0-0-0-1-0-0-0-1
26 January	3	0-0-1-1-2-2-0-0	3	0-0-2-2-2-0-0-0	2	0-0-1-0-1-0-0-1
27 January	3	0-2-1-0-2-1-1-1	0	0-0-1-0-0-0-0-0	3	1-2-0-0-0-0-0-2
28 January	2	2-1-1-0-1-0-0-1	2	0-0-0-3-1-0-0-0	5	1-1-0-1-1-1-2-2

### *Alerts and Warnings Issued*

Date & Time of Issue	Type of Alert or Warning	Date & Time of Event UTC
22 Jan 0501	ALERT: Electron 2MeV Integral Flux >1000pfu	22 Jan 0500
23 Jan 0510	ALERT: Electron 2MeV Integral Flux >1000pfu	23 Jan 0500
24 Jan 0614	ALERT: Electron 2MeV Integral Flux >1000pfu	24 Jan 0500
25 Jan 0625	ALERT: Electron 2MeV Integral Flux >1000pfu	25 Jan 0500
26 Jan 0506	ALERT: Electron 2MeV Integral Flux >1000pfu	26 Jan 0500
27 Jan 0822	ALERT: Electron 2MeV Integral Flux >1000pfu	27 Jan 0815
28 Jan 1054	ALERT: Electron 2MeV Integral Flux >1000pfu	28 Jan 1035



# *Twenty-seven Day Outlook*



Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7 cm	Planetary A Index	Largest Kp Index
31 Jan	90	15	5	14 Feb	75	15	4
01 Feb	90	19	3	15	75	12	4
02	85	5	2	16	75	8	3
03	85	5	2	17	75	5	2
04	85	5	2	18	75	5	2
05	85	5	2	19	75	5	2
06	85	8	3	20	75	5	2
07	85	5	2	21	75	5	2
08	80	5	2	22	80	5	2
09	80	5	2	23	85	5	2
10	80	5	2	24	85	5	2
11	75	15	4	25	85	20	6
12	75	15	4	26	85	20	5
13	75	20	5				



### ***Energetic Events***

Energy Events											
Date	Time			X-ray		Optical Information			Peak		Sweep Freq
	$\frac{1}{2}$			Integ		Imp/	Location	Rgn	Radio Flux		Intensity
	Begin	Max	Max	Class	Flux	Brtns	Lat CMD	#	245	2695	II IV

*No Events Observed*

### ***Flare List***

Date	Time			Optical	Imp / Brtns	Location Lat CMD	Rgn
	Begin	Max	End	X-ray Class.			
22 January	0242	0245	0247	B1.6			939
	0306	0313	0317	B1.0			939
	0542	0548	0555	B1.2			939
	0812	0815	0819	B1.0			939
	0906	0909	0911	B1.2			939
23 January	0905	0909	0918	B1.7			939
	2358	0002	0004	B1.2			
24 January	0028	0032	0035	B5.1			939
	0221	0223	0224		Sf	S04W59	939
	0516	0516	0519	B6.8	Sf	S06W63	939
	1345	1452	1608	B9.0			
25 January	1855	1900	1908	B3.1			939
	0226	0230	0236	B1.9			939
	0522	0526	0528	B3.5			939
	0633	0714	0758	C6.3			940
	1344	1349	1401	B6.3			940
	1405	1422	1430	B9.0			
	1739	1742	1745	B2.6			
	1802	1813	1816	B2.9			
	1901	1904	1910	B3.7			940
	1916	1920	1923	B4.5			940
	2132	2143	2145	C3.4			940
	2132	2143	2145	C3.4			940
26 January	0154	0218	0227	B3.5			940
	0847	0951	1047	B3.6			940
27 January	0119	0124	0128	B1.3			940
	2252	2305	2356	B3.2			940
28 January	1506	1516	1526	B1.6			940
	2245	2303	2319	B1.7			940



### Region Summary

Location			Sunspot Characteristics												
Date	( ° Lat ° CMD)	Helio	Area (10 <sup>-6</sup> hemi)	Extent (helio)	Flares			X-ray			Optical				
		Lon			Spot Class	Spot Count	Mag Class	C	M	X	S	1	2	3	4

#### Region 938

13 Jan	N02E61	226	0110	05	Dso	004	B								
14 Jan	N02E48	226	0120	05	Dso	006	B				2	2	1		
15 Jan	N02E35	226	0090	07	Dso	006	B	1			3		2		
16 Jan	N02E22	226	0060	07	Dso	008	B	2			3	1			
17 Jan	N03E10	224	0010	06	Bxo	007	B								
18 Jan	N01W06	227	0030	12	Bxi	013	B								
19 Jan	N07W13	221	0030	12	Cro	005	B								
20 Jan	N04W27	222	0020	02	Axx	003	A								
21 Jan	N04W40	222													
22 Jan	N04W53	222													
23 Jan	N04W66	222													
24 Jan	N04W79	222													
								3	0	0	8	3	3	0	0

Crossed West Limb.

Absolute heliographic longitude: 227

#### Region 939

20 Jan	S03W17	212	0100	04	Cai	008	B								
21 Jan	S04W30	212	0110	05	Dac	008	B								
22 Jan	S04W43	212	0120	05	Dso	013	B								
23 Jan	S03W55	210	0170	06	Dai	008	B								
24 Jan	S04W69	211	0160	06	Dao	005	B				2				
25 Jan	S06W83	212	0060	02	Axx	001	A								
26 Jan	S06W96	212													
								0	0	0	2	0	0	0	0

Crossed West Limb.

Absolute heliographic longitude: 212

#### Region 940

26 Jan	S06E77	039	0120	01	Hax	001	A								
27 Jan	S06E62	041	0170	04	Hax	001	A								
28 Jan	S06E49	040	0180	07	Dao	003	B								
								0	0	0	0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 040

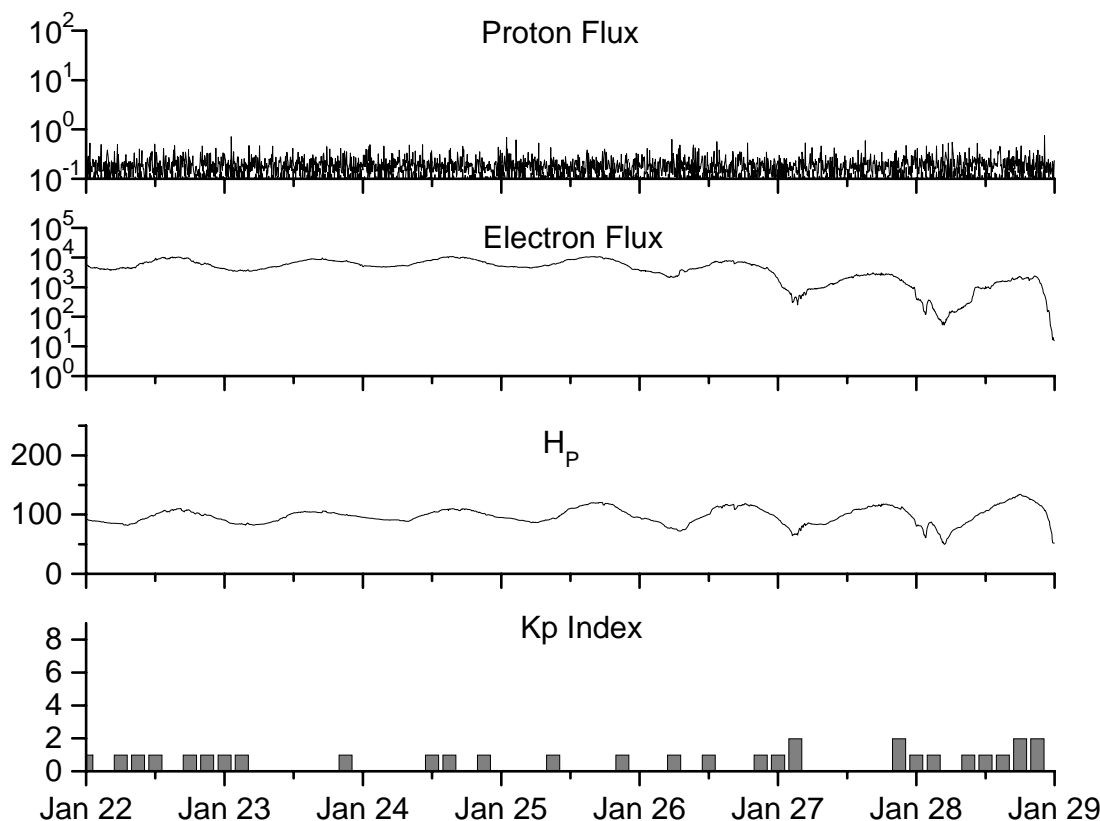


***Recent Solar Indices (preliminary)  
of the observed monthly mean values***

Month	Sunspot Numbers			Radio Flux		Geomagnetic			
	Observed values	Ratio	Smooth values	*Penticton	Smooth	Planetary	Smooth		
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value
2005									
January	52.0	31.3	0.60	57.3	34.7	102.4	100.3	22	14.7
February	45.4	29.1	0.64	56.4	34.0	97.3	98.5	11	14.6
March	41.0	24.8	0.60	55.8	33.6	90.0	97.2	12	15.3
April	41.5	24.4	0.59	52.6	31.7	85.9	95.5	12	15.7
May	65.4	42.6	0.65	48.3	29.0	99.5	93.2	20	14.8
June	59.8	39.6	0.66	47.9	28.9	93.7	91.9	13	13.9
July	71.0	39.9	0.56	48.1	29.2	96.6	90.9	16	13.1
August	65.6	36.4	0.55	45.4	27.5	90.7	89.3	16	12.2
September	39.2	22.1	0.56	42.9	25.9	90.8	87.8	21	11.8
October	13.0	8.5	0.65	42.6	25.5	76.7	87.4	7	11.6
November	32.2	18.0	0.56	42.1	24.9	86.3	86.7	8	11.1
December	62.6	41.2	0.66	40.1	23.0	90.8	85.4	7	10.4
2006									
January	28.0	15.4	0.55	37.2	20.8	83.8	84.0	6	9.9
February	5.3	4.7	0.89	33.4	18.7	76.6	82.6	6	9.2
March	21.3	10.8	0.51	31.0	17.4	75.5	81.6	8	8.4
April	55.2	30.2	0.55	30.6	17.1	89.0	80.9	11	7.9
May	39.6	22.2	0.56	30.7	17.3	81.0	80.8	8	7.9
June	37.7	13.9	0.37	28.9	16.3	80.1	80.6	8	8.3
July	22.6	12.2	0.54			75.8		7	
August	22.8	12.9	0.57			79.0		9	
September	25.2	14.5	0.58			77.8		8	
October	15.7	10.4	0.66			74.3		7	
November	31.5	21.5	0.68			86.4		8	
December	22.2	13.6	0.61			84.3		14	

**NOTE:** All smoothed values after September 2002 and monthly values after March 2003 are preliminary estimates. The lowest smoothed sunspot index number for Cycle 22, RI = 8.0, occurred in May 1996. The highest smoothed sunspot number for Cycle 23, RI= 120.8, occurred April 2000. \*After June 1991, the 10.7 cm radio flux data source is Penticton, B.C. Canada. Prior to that, it was Ottawa.





*Weekly Geosynchronous Satellite Environment Summary*  
*Week Beginning 22 January 2007*

*Protons* plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of three energy thresholds: greater than 10, 50, and 100 MeV.

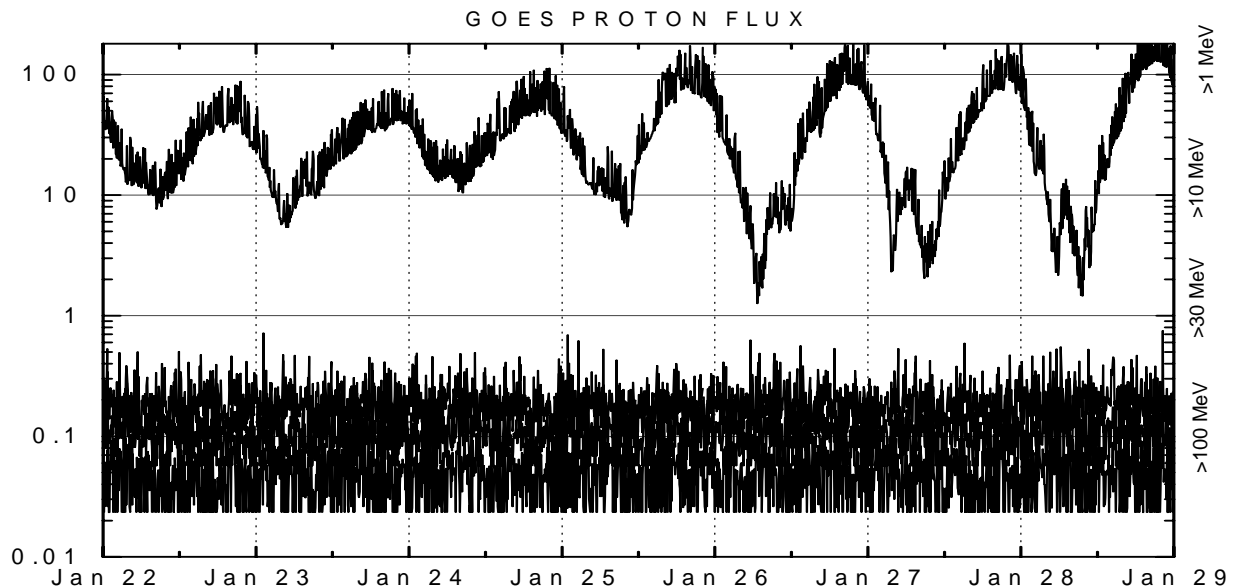
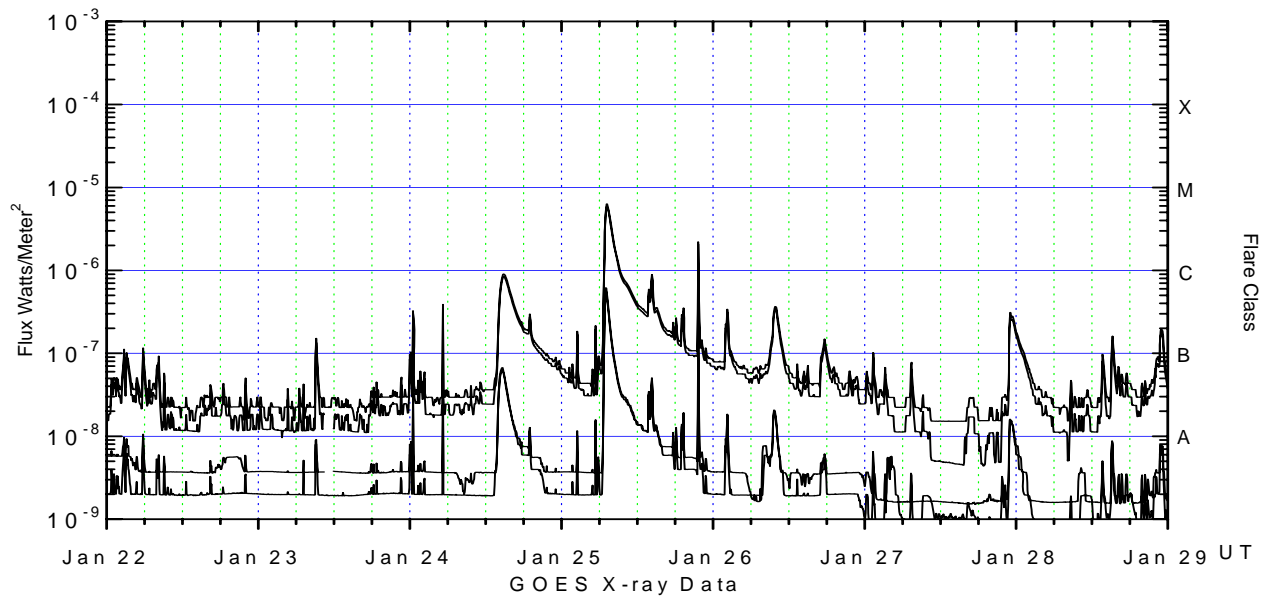
*Electrons* plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec-sr) with energies greater than 2 MeV at GOES-12 (W075).

*H<sub>p</sub>* plot contains the five minute averaged magnetic field H - component in nanoteslas (nT) as measured by GOES-12. The H component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

*K<sub>p</sub>* plot contains the estimated planetary 3-hour K-index (derived by the Air Force Weather Agency) in real time from magnetometers at Meanook, Canada; Sitka, AK; Glenlea, Canada; St. Johns, Canada; Ottawa, Canada; Newport, WA; Fredericksburg, VA; Boulder, CO; Fresno, CA and Hartland, UK. These data are made available through cooperation from the Geological Survey of Canada (GSC), British Geological Survey (BGS) and the US Geological Survey. These may differ from the final K<sub>p</sub> values derived from a more extensive network of magnetometers.

The data included here are those now available in real time at the SEC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and K<sub>p</sub> are "global" parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





### Weekly GOES Satellite X-ray and Proton Plots

X-ray plot contains five-minute averaged x-ray flux (watts/m<sup>2</sup>) as measured by GOES 12 (W075) and GOES 11 (W135) in two wavelength bands, .05 - .4 and .1 - .8 nm. The letters A, B, C, M and X refer to x-ray event levels for the .1 - .8 nm band.

Proton plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec-sr) as measured by GOES-11 (W135) for each of the energy thresholds: >1, >10, >30 and >100 MeV. P10 event threshold is 10 pfu (protons/cm<sup>2</sup>-sec-sr) at greater than 10 MeV.

